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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/996,301	11/21/2001	Saad A. Sirohey	GEMS:0180/YOD (120621)	2561

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EXAMINER	
CHEN, WENPENG	

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/996,301	SIROHEY ET AL.	
	Examiner	Art Unit	
	Wenpeng Chen	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 August 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-70* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-70* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/20/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/22/2007 has been entered.

Examiner's responses to Applicant's remark

2. Applicants' arguments, filed on 8/22/2007, with regard to all the art rejection have been fully considered but are moot in view of the new ground(s) of rejection due to Applicants' amendments to the listed claims. Explanation for meeting the amended claims is provided below.

Claim Rejections - 35 USC § 103

3. As pointed out in the first Office Action, the present application is a CIP of application 09/716,603, filed on 11/20/2000, which is CIP of application 9/448,950, filed on 11/24/1999. The Examiner compared the present application with applications 09/716,603 and 9/448,950 and found that (1) application 9/448,950 disclosed only materials related to Figs. 1-13 of the present application and (2) application 09/716,603 disclosed only materials related to Figs.

1-20 of the present application. Figs. 14-20 of the present application and related portions of specification disclose wavelet decomposition the first time on 11/20/2000. Figs. 20-27 of the tessellating wavelet subband data the first time on 11/21/2001.

Therefore, the Examiner concluded that the disclosure date for the newly added feature "wherein each respective address tag is stored within its data storage block to enable individual identification and retrieval of specific data storage blocks from the plurality of data storage blocks via the address tags of the specific data storage blocks" is 11/21/2001. This conclusion will be applied for determining prior art.

ISO/IEC JTC 1/SC 29/WG 1 N1646 ("JPEG 2000 Image coding system," ISO/IEC JTC 1/SC 29/WG 1. JPEG 2000, 16 March 2000, hereafter referred as N1646) is thus a 102(b) prior art for this feature.

4. Claims 1-15, 17-34, 36-46, 48-53, and 62-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andrew (US patent 6,763,139) in view of Taubman (US patent 6,778,709) and ISO/IEC JTC 1/SC 29/WG 1 N1646 ("JPEG 2000 Image coding system," ISO/IEC JTC 1/SC 29/WG 1. JPEG 2000, 16 March 2000, hereafter referred as N1646).

a. For Claims 1-15 and 17-18,

For Claim 1, Andrew teaches a method for handling image data, the method comprising:

-- decomposing the image data into a plurality of data sets using lossless wavelet decomposition, wherein decomposing the image data using lossless wavelet decomposition comprises creating a hierarchical set of sub-bands, one set comprising a low frequency component at a lowest resolution level and remaining sets comprising high frequency components at successively higher resolution levels; (column 5, line 7 to column 6, line 11;

column 10, lines 23-37; step 103 of Fig. 1; The DWT decomposition can be exactly (lossless) reconstructed.)

-- tessellating a plurality of the decomposed data sets at least one decomposed set of the plurality of data sets into a plurality of sub-band blocks; (column 6, lines 12-23; Each decomposition is divided into tiles *which are sub-band blocks*.)

-- compressing each tessellated block of the plurality of blocks using lossless compression; (column 6, line 23 to column 7, line 33; The entropy encoding and Huffman encoding are lossless.)

-- compiling a data stream comprising the compressed plurality of sub-band blocks arranged sequentially in a desired order based upon the decomposition and tessellation, wherein the data stream comprises a plurality of data storage blocks, each data storage block including a plurality of spatially-equivalent sub-band blocks of the plurality of sub-band blocks and a respective address tag that uniquely identifies the plurality of spatially-equivalent sub-band blocks of each respective data storage block; (column 8, lines 4-13; *The labels (0,0), (0,1), (1,0), and (1,1) are the address tag that uniquely identifies the plurality of spatially-equivalent sub-band blocks. For example, DC (0,0), HL(0,0), LH(0,0), and HH(0,0) are spatially-equivalent sub-band blocks.*)

-- storing the data stream on a server; (column 16, lines 59-64; In one embodiment, the user may retrieve the digital via the communication channel 1230. In such circumstances, the encoding process may be performed on a remote computer (not shown), whilst the decoding process is performed on the computer 1202. The remote computer is a server because it provides the image data.)

However, Andrew does not teach the feature related to "receiving a request for at least a portion of the data stream" as recited in the claim.

Taubman teaches a method for handling image data, the method comprising:

-- receiving a request for at least a portion of the data stream corresponding to an area of interest of an image to be displayed to a client, wherein the steps of decomposing, tessellating, compressing, compiling, and storing are performed prior to receiving any request from the client for data of the data stream; (column 21, lines 1-63; A server receives a request from a client. All the compressed data resided in the server are processed and stored prior to receiving any request from a client- taught both in Andrew and Taubman.)

-- tracking the area of interest for later viewing by the client without storing a separate copy of the portion of the data stream corresponding to the area of interest. (column 21, line 37 to column 22, line 39; *The client at first selects and requests an area of interest. For example, the client requests the whole map that is the first level of region of interest. Then client selects and requests a smaller region of interest from the server for display. During the process,* ***data corresponding to the portion of the data stream corresponding to the area of interest****, such as the higher subband blocks,* ***are not separated stored****. It is combined with the low subband blocks an integrated data set for display. During interactive, selective refining of a region of interest, this process is repeated.*)

It is desirable to have versatility of transmitting image data to many clients according to their individual request. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to apply Taubman's teaching to process and store Andrew's image in a server prior to any request and have the server to receive a request from a client, because the combination improves versatility for handling image data.

However, the combination does not teach the newly-added limitation associated with address tag.

N1646 which is a JPEG2000 standard teaches several address tags for locating data associated tile (sections A.4.2, A.6.1, A.6.2, B.2, B.5; Isot; Fig. B2; The tile is numbered (Isot) in

raster order. The number is an address tag for tile. PPx and PPy provide address tags for precincts.)

It is desirable to have random access capability of retrieving data. The capability can be provided with address indexes for data. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to apply N1646's teaching to format the image data taught by the combination of Andrew and Taubman in the standard JPEG2000 format with address tags, because the overall combination improves versatility for handling image data. The overall combination thus also teaches:

-- wherein each respective address tag is stored within its data storage block to enable individual identification and retrieval of specific data storage blocks from the plurality of data storage blocks via the address tags of the specific data storage blocks.

For the other claims listed above, Andrew further teaches that the method comprises:

-- wherein the lossless wavelet decomposition comprises lossless integer wavelet decomposition; (column 10, lines 24-37; The transform coefficients are in integer representation.)

-- wherein tessellating comprises using a fixed block size for the plurality of blocks; (column 6, lines 12-23)

-- wherein tessellating comprises addressing each tessellated block with a tessellation index for each dimension of tessellation; (column 6, lines 58-64)

-- wherein addressing comprises providing a decomposition level index for identifying a desired set of the plurality of data sets; (column 6, line 65 to column 7, line 3; column 8, lines 4-12)

-- selectively transmitting at least a portion of the data stream, wherein selectively transmitting comprises selecting the portion based upon a desired set of the plurality of data sets

and a desired group of the plurality of sub-band blocks encompassing a region of interest and wherein selecting the portion comprises identifying the desired set and each tessellated block of the desired group using an addressable function; (column 9, lines 22-55; The image data of the selected tiles are transmitted to the decoder for decoding based on the selected resolution and tiles associated with the selected region. The pointer information provides the addressable function.)

-- wherein the data stream comprises a header, which comprises characteristics of the decomposition, the tessellation, and the compression; (column 8, lines 29-48; column 9, lines 13-21, 36-43; The pointer information comprises characteristics of the decomposition and the tessellation.)

-- wherein the data stream comprises a resolution level index for each decomposed set, a tessellation row index for each tessellated block, and a tessellation column index for each tessellated block; (column 8, lines 29-48; column 9, lines 13-21, 36-43; The pointer information inherently needs the labeling information shown in column 8, lines 7-10 for the resolution and tile address to point to the starting point of each tile.)

-- reference marking the area of interest to facilitate later retrieval and/or analysis of the marked area of interest; (column 22, lines 25-39; The information of the accumulated history of client requests associated with each area of interest is a marking for the area. Rate of retrieval and/or quality of retrieved image of an area of interest is inherently marked with the request history. The marking facilitates retrieval by a client a preferred area.)

-- storing the data stream based on indices to the decompositions and tessellations, wherein storing the data stream comprises storing each of the compressed plurality of sub-band blocks in data groups based on the indices; (column 8, lines 7-10; column 16, lines 57-63; The sequence shows the storing sequence based on the indices. For example, DC90,0) and HL3(0,1) are stored as individual groups, respectively.)

-- wherein the plurality of data sets corresponds to a plurality of resolution levels; (column 8, lines 7-10; DC represents one level. HH3, HL3, LH3 represent another level.)

-- reconstructing an image at least partially from the tessellated blocks; (column 9, lines 22-55)

-- dividing each tessellated block into subregions to be individually compressed based upon entropy of each subregion. (column 11, lines 49 to column 12, line 10; blocks 814, 818, and 820 of Fig. 8; At step 814, when a region is insignificant according to eq(1) of column 11, the value of the considered bit plane in the region is uniformly zero, thus having a low entropy. A set of single-value data has entropy of zero. So the decision at step 814 is inherently entropy-based. When the set of the data of the bit plane in the region has at least one non-zero, namely the entropy is not zero, the region is further divided.)

b. For Claims 19-30, Andrew further teaches:

-- wherein transmitting the data stream comprises transmitting at least part of a desired one of the data sets identified by the decomposition level index, the desired one corresponding to an image resolution relatively higher than a locally stored one of the data sets; (column 8, lines 7-10; The sequence is arranged in the order of degree of resolution.)

-- wherein transmitting comprises transmitting over a network. (column 15, lines 53-64; column 16, lines 57-64)

After comparing Claims 1-15 and 18 and Claims 19-30, it is evidently that the combination of the above-cited passages and the passages recited for teaching Claims 1-15 and 18 and motivation as discussed above also teaches Claims 19-30.

c. For Claims 31-34 and 36-37, Andrew further teaches:

-- wherein the plurality of resolution levels comprise a lowest resolution level having a low frequency component and a remaining plurality of resolution levels comprising high frequency components; (Fig. 2; column 8, lines 7-10; DC is a lowest resolution level having a low frequency component. The others are the high frequency components.)

-- wherein tessellating at least part of one level comprises tessellating only the high frequency components. (Andrew's teaching includes a special case where the lowest DC band contains only a single pixel. For example, when a 128 x 128 image is decomposed into 7 resolution levels. The highest level is DC having one single element. The HL6, LH6, and HH6 also all have a single element. A single element cannot be tessellated.)

N1646 further teaches:

-- wherein storing the tessellated and compressed data comprises grouping together a plurality of spatially-equivalent blocks of the plurality of blocks and storing the plurality of spatially-equivalent blocks in an addressable data block comprising the plurality of spatially-equivalent blocks and an address tag uniquely identifying the addressable data block to facilitate individual identification and retrieval of the addressable data block from the tessellated and compressed data. (sections A.4.2, A.6.1, A.6.2, B.2, B.5; Isot; Fig. B2; The tile is numbered (Isot) in raster order. Isot is the tag for retrieving all data blocks associated with a tile identified by the tag.)

After comparing Claims 1-15 and 18 and Claims 31-34 and 36-37, it is evidently that the combination of the above cited passages and the passages recited for teaching Claims 1-15 and 18 and motivation as discussed above also teaches Claims 31-34 and 36-37.

d. For Claims 38-46, and 48, Andrew further teaches:

-- wherein the plurality of resolution levels comprise a lowest resolution level having a low frequency component and a remaining plurality of resolution levels comprising high

frequency components; (Fig. 2; column 8, lines 7-10; DC is a lowest resolution level having a low frequency component. The others are the high frequency components.)

-- wherein forming the data stream comprises providing a header having decomposition statistics and tessellation statistics for the plurality of addressable data blocks. (column 8, lines 29-48; column 9, lines 13-21, 36-43; The pointer information comprises information of Bytes of tile and triplet of tiles that are statistics related to the tessellation and the decomposition, respectively.)

Taubman further teaches:

-- wherein the data for the plurality of spatial blocks is stored on the server independent of any request from a client for any data of the plurality of spatial blocks. *(column 21, lines 1-63)*

N1646 further teaches:

-- wherein an addressable data block of the plurality of addressable data blocks comprises a plurality of spatially-equivalent blocks of the plurality of spatial blocks and an address tag uniquely identifying the addressable data block to facilitate individual identification and retrieval of the addressable data block from the stored data. (sections A.4.2, A.6.1, A.6.2, B.2, B.5; Isot; Fig. B2; The tile is numbered (Isot) in raster order. Isot is the tag for retrieving all data blocks associated with a tile identified by the tag.)

After comparing Claims 1-15 and 18 and Claims 38-44, 46, and 48, it is evidently that the combination of the above cited passages and the passages recited for teaching Claims 1-15 and 18 and motivation as discussed above also teaches Claims 38-44, 46, and 48.

e. Claims 49-53 and 62 are the corresponding systems of method described in Claims 1-15 and 18. For Claims 49-53 and 62, Andrew teaches a system (Fig. 12) to implement the methods of Claims 1-15 and 18-30, comprising:

-- an interface comprising circuits that are modules for performing functions of decomposition, tessellation. addressing blocks, compression, storage control, ordering data, and transmitting desired portions described in Claims 1-15 and 18-30;

-- a memory device configured to store the plurality of addressable data blocks. (column 16, lines 57-64)

N1646 further teaches:

-- an addressing module configured for indexing the desired portions into a plurality of addressable data blocks based on the resolution levels and coordinates of the spatial blocks, each addressable data block including a plurality of spatially- equivalent blocks from the plurality of spatial blocks and an embedded address tag that uniquely identifies the respective addressable data block to facilitate individual identification and retrieval of a particular addressable data block from the plurality of addressable data blocks. (sections A.4.2, A.6.1, A.6.2, B.2, B.5; Isot; Fig. B2; The tile is numbered (Isot) in raster order. Isot is the tag for retrieving all data blocks associated with a tile identified by the tag. The number is an address tag for tile. PPx and PPy provide address tags for precincts.)

After comparing Claims 1-15 and 18-30 and Claims 49-53 and 62, it is evidently that the combination of the above cited passages and the passages recited for teaching Claims 1-15 and 18-30 and motivation as discussed above also teaches Claims 49-53 and 62.

f. Claims 63-70 are the corresponding computer programs of method described in Claims 1-15 and 18-30. For Claims 63-70, Andrew teaches a machine-readable medium with computer algorithms (column 15, lines 28-52) to implement the methods of Claims 1-15 and 18-30.

After comparing Claims 1-15 and 18 and Claims 63-70, it is evidently that the combination of the above-cited passages and the passages recited for teaching Claims 1-15 and 18-30 and motivation as discussed above also teaches Claims 63-70.

5. Claims 54-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Andrew (US patent 6,763,139) and Taubman (US patent 6,778,709) as applied to Claim 49, and further in view of Cooke, Jr. et al. (US patent 6,574,629 cited previously.)

The combination of Andrew and Taubman teaches the parent Claim 49.

However, the combination does not teach a picture archiving and communication system (PACS) or imaging systems recited in the above-listed claims.

Cooke teaches PACS system, comprising:

-- a PACS system; (column 33, lines 28-40)

-- an MRI system, a computed tomography system, a positron emission tomography system, a radio fluoroscopy system, a computed radiography system, and an ultrasound system; (Fig. 1; column 9, line 66 to column 10, line 51; column 34, lines 1-20)

-- compression image data for storage, transmission, and retrieval. (column 9, line 66 to column 10, line 51; column 13, line 61 to column 14, line 5)

It is desirable to decode a localized portion of a medical image efficiently for viewing and analysis. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to apply Andrew's compression system and method to compress various images used in Cooke's PACS system because the overall combination of Andrew, Taubman, and Cooke, Jr. facilitates retrieval of interested regions in medical images for medical analysis.

6. Claims 16, 35, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Andrew (US patent 6,763,139) and Taubman (US patent 6,778,709) as applied to Claims 1 and 33, and further in view of Sodagar et al. (US patent 6,157,746 cited previously.)

The combination of Andrew and Taubman teaches the parent Claims 1 and 33.

However, the combination does not teach the feature related different coding for low-frequency and high-frequency components.

Sodagar teaches a wavelet compression system and method, comprising:

-- compressing the high-frequency components using actual values, and compressing the low frequency component at the lowest resolution level using prediction errors. (column 18, lines 3-24)

It is desirable to improve coding efficiency. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to apply Sodagar's teaching of coding Andrew's LL band with predicting error in Andrew's compression system and method because the overall combination of Andrew, Taubman, and Sodagar improves coding efficiency of LL band and thus the whole image.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wenpeng Chen whose telephone number is 571-272-7431. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone numbers for the organization where this application or proceeding is assigned are 571-273-8300 for regular communications and 571-273-8300 for After Final communications. TC 2600's customer service number is 571-272-2600.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2600.

Wenpeng Chen
Primary Examiner
Art Unit 2624

October 17, 2007